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PENSOFT

Distribution of *Epipompilus aztecus* (Cresson, 1869) (Hymenoptera, Pompilidae) with a new record from Texas, United States

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Abstract

The genus *Epipompilus* Kohl, 1884 occurs in the New World and Australasian regions. *Epipompilus aztecus* (Cresson, 1869) has been previously recorded in Mexico, Central America and South America. The record presented here expands the distribution of this species further north, into the south-central United States.

Key words

Edwards plateau, range extension, Pepsinae.

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Introduction

The wasp genus *Epipompilus* Kohl, 1884 is represented in the New World by 16 species (Evans 1966, 1967, 1976) and Australasia by 35 species (Evans 1972). Within the Pompilidae, this genus possesses several ancestral characters, especially in the venation of the posterior wing (Evans 1966). The crossvein cu-a forms a strong angle with vein A and is nearly straight, oblique and meets M+CuA before the separation of vein CuA from vein M. This wing venation is similar to 2 other presumably ancestral genera, *Tastiotenia* Evans, 1950 and *Allaporus* Banks, 1933 (Evans 1962, 1966, 1972). In more derived genera the crossvein cu-a forms a continuous curve with vein A and meets M+CuA at or beyond the separation of vein CuA from vein M (Evans 1951, Wasbauer and Kimsey 1985). The placement of the genus has been problematic. It has been considered as a member of the subfamilies Pompilinae (Evans 1966), Epipompilinae (Shimizu 1994), and Ctenocerinae (Pitts 2005). The most current evidence suggests affinities with *Minagenia* Banks, 1934 within Pepsinae (Waichert et al. 2014).

The biology of the New World species is completely unknown (Evans 1967). The biology of a species from New Zealand, *E. insularis* Kohl, 1884, has been described. This species attacks retreat-nesting spiders of the genus *Trite* Simon, 1885 (Salticidae) and *Clubiona* Latreille, 1804 (Clubionidae) while they are in or near their silken retreat, especially while they are guarding eggs (Harris 1987, 1999). The wasp oviposits immediately after paralyzing the spider and does not construct a nest. Paralysis of the spider is light and brief and the larval wasp can tolerate considerable movement by the host as it resumes activity (Harris 1987).

Epipompilus aztecus (Cresson, 1869) is a distinctively colored species originally described from Mexico with subsequent records from Guatemala and Panama (Evans 1966, 1967). Recently several records have been presented that extend the range of this species into South America (Silvestre et al. 2010, dos Santos et al. 2010). So far, the only species in this genus known for North America is *E. pulcherrimus* (Evans, 1955) which is found

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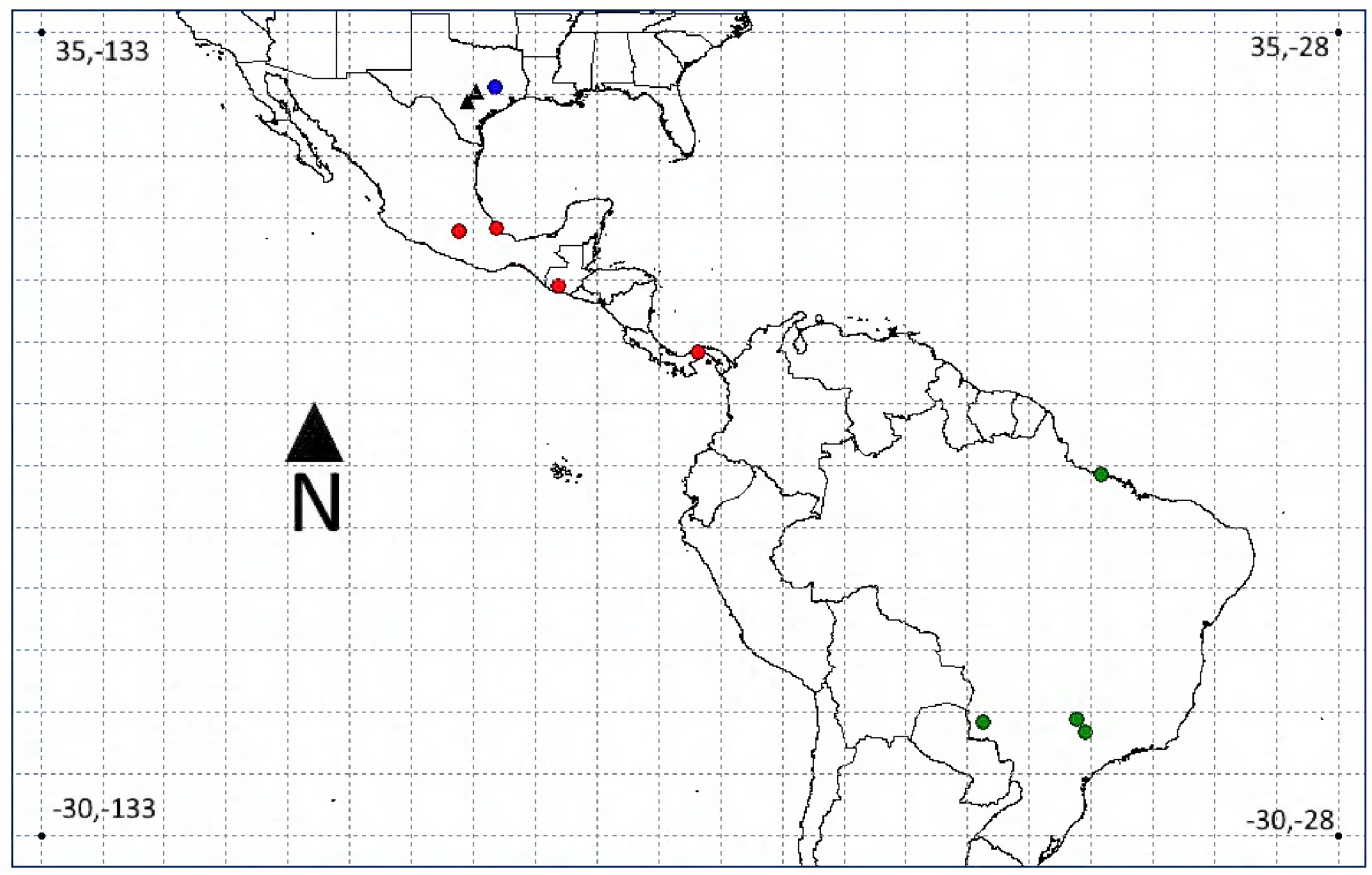

Figure 1. Map showing collection localities of *E. aztecus* (Cresson). The blue circle represents the specimen reported in this study. The black triangles represent photographic records (Carpenter 2017, Donehew, 2008). The red circles represent records from Evans (1961, 1967) and the green circles represent records from dos Santos (2010) and Silvestre (2010).

in southern Florida. Here, I present a record of *E. aztecus* from College Station, Brazos County, Texas, USA, based on a single female.

Methods

Lick Creek Park, where the new record was collected, is a 208 ha park in Post Oak (*Quercus stellata* Wangenh.) savannah habitat on the southeastern side of College Station, Brazos County, Texas. The area where this wasp was collected is at the convergence of three ecological areas: the Edwards plateau, blackland prairies, and Post Oak savannah. The geology of the eastern Edwards plateau is primarily composed of early cretaceous limestone (Fowler 2005). Vegetation is composed of grasses and other herbaceous plants in the prairies. The Post Oak savannah is comprised of similar herbaceous plants punctuated by stands of Post Oak. Mesquite shrub or Mesquite (*Prosopis* sp.), Live Oak (*Quercus fusiformis* Small), and Ashe Juniper (*Juniperus ashei* Buchholz) comprises the vegetation on the Edwards Plateau (McMahan 1984). The climate is continental with approximately 860 mm of rain per year on the Edwards Plateau and increasing to 1150 mm in the Post Oak savannah (Fowler 2005). Temperature ranges from 4 °C in January to 36 °C in August (Fowler 2005). Coordinates were not recorded on the specimen label by the collector, R. Wharton, and were approximated using Google Maps. Information for identification and comparative morphological information, including keys and species descriptions, was obtained from Evans (1961, 1966, 1967, 1976). Terminology for facial measurements follows Evans (1950). The map (Fig. 1) was produced with the presented record, photographic records, and known literature records (Evans 1966, 1967, Silvestre et al. 2010, dos Santos et al. 2010; Table 1) using the DIVA-GIS (version 5.0) mapping program (Hijmans et al. 2004).

Table 1. Locations and coordinates for *Epipompilus aztecus* . Most accurate possible estimation of location is given.

Location	Reference	Latitude	Longitude	Note
Lick Creek Park, College Station, Brazos County, Texas, USA	Current paper	30.5622	–096.2145	
Austin, Travis County, Texas, USA	Bugguide.net, Carpenter (2017); (Fig. 3, 4)	30.2448	–097.8270	Coordinates obtained from photographer
San Antonio, Bexar County, Texas, USA	Bugguide.net, Donehew (2008)	29.4154	–098.5081	Approximate location
Serra da Bodoquena NP, Mato Grosso do Sol, Brazil	Silvestre et al. (2010)	–20.7822	–056.7419	
Sao Joao de Pirabas, Boa Esparanca, Para, Brazil	Santos et al. (2010)	–00.7689	–047.1739	
Farm Fisher, Onda Verde, Sao Paulo, Brazil	Santos et al. (2010)	–20.5483	–049.2428	
Matao, Sao Paulo, Brazil	Santos et al. (2010)	–21.6206	–048.5372	
Cuernavaca, Morelos, Mexico	Evans (1961)	18.9085	–099.2186	Best approximation of location
Veracruz, Mexico	Evans (1961)	19.1590	–096.1959	Best approximation of location
Barro Colorado Is., Panama	Evans (1967)	09.1542	–079.8489	Best approximation of location
Santa Adelaida, Guatemala	Evans (1967)	14.4998	–091.1830	Best approximation of location

Results

New record. USA: Texas, Brazos County, College Station, Lick Creek Park (30°33′43″ N, 096°12′54″ W, coordinates approximated), 20–30.ix.2009, col. R. Wharton (Texas A&M University Entomology Collection, X1353372), 1 specimen.

Identification. *Epipompilus* is characterized by the following: Dorsum of the pronotum forming a rounded right angle with the lateral face, the latter being nearly vertical and concave; hingwing crossvein cu-a forming a strong angle with vein A, nearly straight, oblique, originating far basad of the separation of vein M+CuA; unusually elongate maxillary palpi; labrum exerted beyond clypeus; malar space well developed; pronotum of moderate length on the midline, streptaulus absent; front femora slightly incrassate, that is, the front femora are thicker than the mid femora; legs nearly completely devoid of spines; forewing usually with three submarginal cells (Evans 1967). Many species have setose compound eyes, although some from the Australasian region do not (Evans 1962, 1967, 1972). *Epipompilus aztecus* belongs to the *aztecus* species group, which is characterized by the following: compound eyes slightly convergent dorsally, lower interocular distance noticeably exceeding upper interocular distance; the frons is moderately wide, the width noticeably greater than the width of the eyes taken together, middle interocular distance at least 0.57 times the transfacial distance (Evans 1967). *Epipompilus aztecus* is characterized by fasciate wings, enitrely rufoferruginous mesosoma, and black metasoma with white markings on terga two and five but no white markings on the sterna (Evans 1967).

Epipompilus pulcherrimus is the only member of this species group lacking bands on the wings. Among the rest of the species group, *E. inca* Evans, 1967, *E. jocosus* Evans, 1967, and *E. morosus* Evans, 1976 have the mesosoma mostly black and have white markings on second through fifth or sixth metasomal terga and often on the basal sterna. *Epipompilus bifasciatus* (Ashmead, 1902) is the most similar to *E. aztecus*, possessing fasciate wings, rufoferruginous mesosoma, and black metasoma, but has white markings on the second through fifth terga and second and third sterna. There are other members of *Epipompilus* similar in color to *E. aztecus*, but they differ considerably in facial measurements. The specimen presented here (Fig. 2) falls in the range of facial measurements described for *E. aztecus*. The middle interocular distance is 0.59 times the transfacial distance. The lower interocular distance is 1.04 times the upper interocular distance. The specimen also agrees in color with *E. aztecus*, the mesosoma being rufoferruginous, the metasoma black with paired white spots on the second tergum and presenting a white band on the fifth tergum. The posterior rim of the propodeum is white. The forewings are hyaline and strongly twice-banded, with a broad, dark band across the wing at the level of the marginal cell and a narrower band across vein 1rs-m.

Figure 2. Lateral view of *Epipompilus aztecus* specimen presented in this study from Brazos County, Texas.

Discussion

Evans (1966) called this a striking and distinctive species. Specimens from southern localities (Brazil, but also including Panama specimens) are generally darker, with infuscate forelegs and the propodeal rim concolorous with the mesosoma (Evans 1967, dos Santos et al. 2010). In Central American specimens (aside from Panama specimens) the propodeal rim is white and the forelegs are rufoferruginous with no infuscation (dos Santos et al. 2010). The specimen presented here has a similar pattern to the Central American specimens and current evidence suggests clinal variation with respect to coloration. However, there are large gaps within the distribution of *E. aztecus*, where there are no known specimens. Evans (1966) noted that these wasps appear to be exceedingly rare. *Epipompilus aztecus* is still known from only a few specimens from southern Brazil, Panama, Costa Rica, Guatemala, Mexico, and the south-central United States (Fig. 1). The record from Costa Rica is based on dos Santos et al. (2010) but coordinates for that record could not be obtained and so it is not included on the map. Two photographic records (Donehew 2008, Carpenter 2017) are presumed to be *E. aztecus* based on coloration and the proximity of the records to the specimen presented here, though this cannot be confirmed and this data is interpreted here with caution. Despite the rather small number

Figures 3, 4. Probable *Epipompilus aztecus* from Austin, Travis County, Texas (Carpenter, 2017). **3.** Lateral view. **4.** Dorsal view.

of specimens, the data indicates a wide distribution that may be continuous from the United States to southern Brazil. Gaps in distributional data are possibly due to the lack of studies for the genus and lack of studies within the suspected range of *E. aztecus* (dos Santos et al. 2010). A larger sample effort is required to document actual species richness in areas such as Amazonian forests, where the largest gaps in data occur (dos Santos et al. 2010).

Given its broad geographic distribution, *E. aztecus* does not seem to be associated with a particular habitat. A recent record from Brazil in Serra da Bodoquena National Park (Silvestre et al. 2010) is actually in an area of sub-montane seasonal deciduous forest very similar in climate to south-central Texas. Rainfall, temperature, and vegetative communities, in general, are very similar. However, this is not to imply that this indicates a habitat preference. Other specimens have been collected from a variety of habitats, such as the tropical evergreen forests on the Atlantic coast of Brazil (dos Santos et al. 2010) and Barro Colorado Island in Panama, as well as sub-montane forests in Guatemala (Evans 1967). Collections vary in altitude from near sea-level at São João de Pirabas, Brazil (dos Santos et al. 2010) to near 1000 m above sea-level at Santa Adelaida, Guatemala (Evans 1967). Ultimately, continued collecting effort, especially in areas that completely lack data, may be the best strategy to elucidate the range of this species.

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